

REMARKS

By this Amendment, claims 1-6 and 14-20 are cancelled, claims 7-12 are amended, and claims 21-27 are added. Claim 13 remains in the application. Thus, claims 7-13 and 21-27 are active in the application. Reexamination and reconsideration of the application are respectfully requested.

The specification and abstract have been carefully reviewed and revised in order to correct grammatical and idiomatic errors in order to aid the Examiner in further consideration of the application. The amendments to the specification and abstract are incorporated in the attached substitute specification and abstract. No new matter has been added.

Also attached hereto is a marked-up version of the substitute specification and abstract illustrating the changes made to the original specification and abstract.

In item 1 on page 2 of the Office Action, the Examiner required that Figure 16 be labeled as 'Prior Art' because Figure 16 illustrates a conventional recording apparatus 1600, as described in the Background of the Invention section of the original specification. Accordingly, in view of this requirement by the Examiner, Figure 16 has been labeled as 'Prior Art.' Replacement formal drawings of Figures 1-16 are submitted concurrently herewith under a separate cover letter. Approval of the replacement formal drawings is illustrated.

The Applicants note the Examiner failed to acknowledge, in item 12 on the Office Action Summary form, the Applicants' claim of foreign priority based on Japanese Patent Application No. 2000-190900. A Claim of Priority Under 35 USC 119 and a certified copy of the foreign priority document were both filed with the present application on June 14, 2001. Accordingly, the Applicants respectfully request the Examiner to acknowledge the Applicants' claim of foreign priority and the receipt of the certified copy of the foreign priority document.

In item 3 on page 2 of the Office Action, claims 7-13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Browne et al. (WO 92-22983) in view of Kikuchi et al. (U.S. 6,577,812). This rejection is respectfully traversed for the following reasons.

Claim 7 and new claim 21 each recite a remaining recordable time calculation apparatus for calculating a remaining recordable time of a recording medium. As recited in claims 7 and 21, the recording medium contains one or more video streams and corresponding management information, and the one or more video streams are compressed when recorded on the recording medium.

The remaining recordable time calculation apparatus of claim 7 comprises management data read means for reading, from the recording medium, a running time of the one or more video streams. The remaining recordable time calculation apparatus of claim 7 also comprises total time holding means for holding a total time period for which recording is possible on the recording medium.

The remaining recordable time calculation apparatus of new claim 21 comprises a management data read unit operable to read, from the recording medium, a running time of the one or more video streams. The remaining recordable time calculation apparatus of new claim 21 also comprises a total time holding unit operable to hold a total time period for which recording is possible on the recording medium.

Claims 7 and 21 each define that the total time period for which recording is possible is obtained by first subtracting an estimate error value from a capacity of the recording medium, and then by dividing the subtraction result by a standard bit rate. Claims 7 and 21 also each define that the estimate error value estimates at least one of an estimate error occurring during compression of a video stream and a size of an unrecordable area inherent in the recording medium, and the standard bit rate is a bit rate used in compressing a video stream to be recorded on the recording medium.

Furthermore, the remaining recordable time calculation apparatus of claim 7 is also recited as comprising time calculation means for calculating the remaining recordable time by subtracting the running time of the one or more video streams read by the management data read means from the obtained total time period for which recording is possible. The remaining recordable time calculation apparatus of new claim 21 is also recited as comprising a time calculation unit operable to calculate the remaining recordable time by subtracting the running time of the one or more video streams read by the management data read unit from the obtained total time period for which recording is possible.

Accordingly, claims 7 and 21 recite that the remaining recordable time of the recording medium is:

the total time period for which recoding is possible—running time.

Claims 7 and 21 recite that the total time period for which recording is possible is obtained by subtracting the estimate error value from the capacity of the recording medium (i.e., (capacity of recording medium)–(estimate error value)), and then dividing this result by the standard bit rate. Accordingly, claim 7 defines that the total time period for which recording is possible =
(capacity of recording medium–estimate error value)/standard bit rate.

Thus, the remaining recordable time calculation apparatus of claims 7 and 21 is recited as calculating a remaining recordable time by using the following formula:
remaining recordable time =

$$[(\text{capacity of recording medium} - \text{estimate error value}) / (\text{standard bit rate})] - \text{running time}.$$

Accordingly, in the formula for calculating a remaining recordable time as recited in claims 7 and 21, neither a recording bit rate (the bit rate actually used in recording) that varies from program to program, nor a recorded data size that is susceptible to different values of the recording bit rate are used as parameters. As a result, according to the remaining recordable time calculation formula recited in claims 7 and 21, an increase/decrease in a remaining recordable time caused by the recording/deletion of a program will not be affected by a recording bit rate. Thanks to this characteristic, the remaining recordable time calculation formula recited in claims 7 and 21 is advantageous in that an increase/decrease in a remaining recordable time caused by the recording/deletion of a program will fully match with the running time of the program.

As acknowledged by the Examiner, Browne et al. fails to disclose, suggest or even contemplate the details of calculating a remaining recordable time. To teach this feature, the Examiner applied Kikuchi et al.

Kikuchi et al., however, uses the following formula to calculate a remaining recordable time:

remaining recordable time =

(capacity of recording medium – estimation error value – recorded data size)/average recording bit rate (see Column 45, lines 18-31 and Column 61, lines 54-58).

The formula used in Kikuchi et al. attempts to obtain a more accurate estimation of a remaining recordable time by dividing the remaining capacity of the recording medium by the average of recording bit rates actually used so far. However, since the recording bit rate is variable, an increase/decrease in a remaining recordable time caused by the recording/deletion of a program will cause the calculated remaining recordable time to have a greater difference with the actual running time of a program.

For example, suppose a case where a first program is already recorded on a medium, and a second program, which is the same in running time as the first program but has a recording bit rate that is half the recording bit rate of the first program, is newly recorded on the medium. Then, if the formula of Kikuchi et al. is used, the calculated remaining recordable time of the medium will not be shorter in the amount of the running time of the second program. Instead, the calculated remaining recordable time in which the recording of the second program is incorporated will be longer than the remaining recordable time before the recording of the second program.

Conversely, suppose a case where both the first and second programs are recorded on a medium, and the second program is deleted from the medium. Then, if the formula of Kikuchi et al. is used, the remaining recordable time of the medium will not be long in the amount of the running time of the second program. Instead, the calculated remaining recordable time in which the deletion of the second program is recorded will be shorter than the remaining recordable time before the deletion of the second program.

The user will be at a loss as to how to deal with these cases.

Accordingly, similar to Browne et al., Kikuchi et al. also does not disclose or suggest the remaining recordable time calculation apparatus of claims 7 and 21, which are recited as calculating the remaining recordable time as

remaining recordable time =

[(capacity of recording medium–estimate error value)/(standard bit rate)]–running time.

Therefore, neither Browne et al. nor Kikuchi et al., either individually or in combination, disclose or suggest the remaining recordable time calculation apparatus of

claims 7 and 21 which do not use parameters that are susceptible to different values of recording bit rates. The remaining recordable time calculation apparatus of claims 7 and 21 thus have a novel advantage in that an increase/decrease in a remaining recordable time caused by the recording/deletion of a program perfectly matches the running time of a program.

Accordingly, no obvious combination of Browne et al. and Kikuchi et al. would result in the inventions of claims 7 and 21 since Browne et al. and Kikuchi et al., either individually or in combination, fail to disclose or suggest each and every limitation of claims 7 and 21.

Furthermore, it is submitted that the clear distinctions discussed above are such that a person having ordinary skill in the art at the time the invention was made would not have been motivated to modify Browne et al. and Kikuchi et al. in such a manner as to result in, or otherwise render obvious, the present invention as recited in claims 7 and 21.

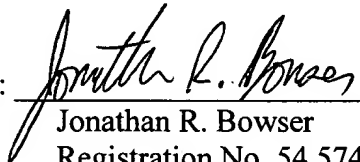
Therefore, it is submitted that the claims 7 and 21, as well as claims 8-13 and 22-27 which depend therefrom, are clearly allowable over the prior art as applied by the Examiner.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice thereof is respectfully solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

Eiichi HATAE et al.

By: 
Jonathan R. Bowser
Registration No. 54,574
Attorney for Applicants

JRB/nrj
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
August 22, 2005

AMENDMENTS TO THE DRAWINGS

***Replacement formal drawings of Figures 1-16 are submitted concurrently
herewith under a separate cover letter.***